

Species

Traditional and Medicinal Uses of *Garcinia gummi-gutta* Fruit - A Review

Naveen GPAN^{1*}, Krishnakumar G²

1. Research Student, Department of Applied Botany, Mangalore University, Mangalagangothri 574199 D.K., Karnataka, India, E-mail: arbinaveen@yahoo.co.in, 9449330901
2. Chairman, Department of Applied Botany, Mangalore University, Mangalagangothri 574199 D.K., Karnataka India, E-mail: kkgmane@rediffmail.com, Ph: 9448824082

*Corresponding Author: Research Student, Department of Applied Botany, Mangalore University, Mangalagangothri 574199 D.K., Karnataka, India, E-mail: arbinaveen@yahoo.co.in, 9449330901

Received 18 May; accepted 20 June; published online 01 July; printed 16 July 2013

ABSTRACT

This paper reviews the traditional folklore knowledge of the uses of the fruit of *Garcinia gummi-gutta* and the present research studies on the medicinal importance of the fruit rind and the seeds. The species has a potential usage even in food preparation and curing of fish. The fruit juice possesses anti-scorbutic, anthelmintic and cardiostimulant properties. The fruit juice, fruit rind and seeds are also utilized in the treatment of various ailments in the Indian Ayurveda system. To know the earlier compiled scientific knowledge and research performed on this species we decided to review the traditional and medicinal properties and the various chemicals isolated and characterized from the *Garcinia gummi-gutta* fruits.

Key words: *Garcinia gummi-gutta*, Malabar Tamarind, Clusiaceae, rheumatism, antiobesity.

1. INTRODUCTION

Genus *Garcinia* belongs to the family Clusiaceae and its species are distributed widely throughout the tropical Asia and African countries and have tremendous potential as spice and medicinal plants. The genus *Garcinia* includes 300 species, of which about 30 different species are reported to be grown in Andaman Islands, North East Hill region, West Bengal, Orissa, Bihar, Western Ghats covering Maharashtra, Goa, Karnataka, Kerala and Nilgiri hills in India (Krishnamurthy et al, 2006). *Garcinia indica* (Kokum), *Garcinia gummi-gutta*, *Garcinia xanthochymus*, and *Garcinia spicata* are widely distributed in the Western Ghats, of which the former two are the most widely spread species in Goa region of Konkan belt and northern part of Kerala respectively, with tremendous natural variability.

The genus *Garcinia* has been involved in Ayurvedic preparations to medicate various patho-physiological disorders. The bioactive molecules like hydroxycitric acid (HCA), flavonoids, terpenes, polysaccharides, procyanidines and polyisoprenylated benzophenone derivatives like garcinol, xanthochymol and guttiferone isoforms have been isolated from the genus *Garcinia*. The genus has received the attention of pharmaceutical industries due to their immense remedial qualities. The HCA has been known for its hypo-lipidemic property. The polyisoprenylated benzophenone and xanthone derivatives are known for their antioxidant, apoptotic, anti-cancer, anti-inflammatory, anti-bacterial, anti-viral, anti-fungal, anti-ulcer, anti-protozoal, and HAT inhibiting properties. In this paper we reviewed the traditional and medicinal properties of the fruit rind and seeds of *Garcinia gummi-gutta* (L) N. Robson. In the west coast of South India, *Garcinia gummi-gutta* is commonly known as "Malabar Tamarind". The fruit, which is 4 - 5cm in diameter, is green in color that changes to yellow when ripe and resembles a small pumpkin. It has deep longitudinal grooves (6-8) and 6 to 8 seeds surrounded by a succulent

aril. With exceeding sharp but pleasant acidity the fruit though edible, is eaten raw perhaps at meals, as an appetizer in the East Indies (Anonymous, 1992).

2. TRADITIONAL PROCESSING OF THE FRUIT

The ripe fruit is halved or sectioned and spread in thin layers, dried in the sun for three to seven days to moisture level of about 15 to 20 percent and smoked. Rind which is available commercially is loaded with considerable amounts of common salt, which is added during drying. The thick rind is cut into sections, dried in the sun and preserved for future use in Sri Lanka. This dried material along with salt is used for curing of fish. The fruit rind and extracts of *Garcinia* species are used in many traditional recipes especially for fish curries. In the Indian Ayurvedic system these types of fruits having sour taste are said to promote digestion. Apart from these uses in food preparations and preservation, the fruit juice possesses anti-scorbutic, anthelmintic and cardiostimulant properties. Hence it finds application in the treatment of piles, dysentery, tumors, pains and heart complaints (Verghese, 2000). The decoction of the fruit rind is given in rheumatism and bowel complaints. It is also employed in veterinary medicine as a rinse for diseases of the mouth in cattle. The dried rind is also used for polishing gold and silver and as a substitute for acetic and formic acids in the coagulation of rubber latex. The yellow resin obtained from the fruit is soluble in turpentine and used as varnish.

The dormancy mechanism and effects of treatments on the germination of *Garcinia gummi-gutta* was studied by Anilkumar et al (2002). Quantitative analysis of (-) hydroxy citric acid and (-) hydroxy citric acid lactone in *Garcinia gummi-gutta* was done by Antony et al (1998). *Garcinia gummi-gutta* extract was isolated and was used as a potential antiobesity agent to inhibit lipogenesis and

stimulation of lipolysis in 3T3 L1 cells by Hasegawa (1998). Mahendran et al. (2002) studied the prevention of HCl-ethanol induced gastric mucosal injury in rats by *Garcinia gummi-gutta*. The effects of long-term administration of *Garcinia cambogia* extract on visceral fat accumulation was studied by Hayamizu et al. (2001). A randomized controlled trial to prove the efficacy of *Garcinia gummi-gutta* (Hydroxycitric acid) as a potential antiobesity was performed by Heymsfield et al. (1998). Inuma et al. (1998) reported a new xanthone from *Garcinia gummi-gutta*. Jayaprakasha et al. (1998) reported the presence of organic acids from *Garcinia gummi-gutta* by High performance liquid chromatography. Chacko et al. (1997) studied the seed characteristics and germination of *Garcinia gummi-gutta*. Kong et al. (1997) described the influence of different processing methods on the mutagenicity of *Garcinia gummi-gutta* trees. Mahendran et al. (2001) have reported the

modulating effect of *Garcinia gummi-gutta* extract on ethanol induced peroxidation and the effect of *Garcinia gummi-gutta* extract on lipids and lipoprotein composition in dexamethasone administered rats. The chemical constituents of the fruit rind and seed of *Garcinia gummi-gutta* was studied and reported by Naveen et al. (2012). Copper, Iron, Chromium and Nickel content of the seeds and fruit rind samples were analyzed by Atomic Absorption Spectroscopy. The proximate analyses and physicochemical analyses of the extracts of *Garcinia gummi-gutta* seed and rind were performed by Naveen et al. (2012). Comparatively, the detailed study of the medicinal and nutritional utilization of the fruits of *Garcinia gummi-gutta* is need of the hour as the fruit rind and seeds are rich sources of phyto-nutrients and nutraceutical.

REFERENCES

- Anilkumar C, Babu KP, Krishnan P. Seed storage and viability of *Garcinia gummi-gutta*, an endemic species of South Western Ghats, India. *Seed Sci. Technol.* 2002, 30, 651-657
- Anonymous. *Wealth of India. Raw Materials.* 1992, Vol. 3. CSIR 320-324
- Chacko KC, Chandrasekhara Pillai PK. Seed characteristics and germination of *Garcinia gummi-gutta* (L.) Robs, *Indian Forester* 1997, 123(2), 123-126
- Hasegawa N. *Garcinia* extract inhibits lipid droplet accumulation without affecting adipose conversion in 3T3 – L1 cells. *Phytotherapy Research* 1998, 15(2), 172-173
- Hayamizu K, Hirakawa H, Oikawa D, Nakanishi T, Takagi T, Tachibana T. Effect of *Garcinia cambogia* extract on serum leptin and insulin in mice. *Fitoterapia.* 2003, 74(3), 267-273
- Heymsfield SB, Allison DB, Vasselli JR, Pirotbelli A, Greenfield D, Nunez C. *Garcinia cambogia* (hydroxycitric acid) as a potential antiobesity agent: A randomized controlled trial. *Journal of the American Medical Association* 1998, 280(18), 1596-1600
- Inuma MT, Ito R, Miyake H, Tosa T, Tanaka, Chellakurai V. A xanthone from *Garcinia cambogia*. *Phytochemistry* 1998, 47(6), 1169-1170
- Ilyas M, Kamil M, Parveen M, Khan MS. Isoflavones from *Garcinia nervosa*. *Phytochemistry* 1994, 36(3), 807
- Jayaprakasha GK, Sakariah KK. Determination of (-) hydroxycitric acid in commercial samples of *Garcinia cambogia*. *Journal of Liquid Chromatography and Related Technologies* 2000, 23(6), 915-924
- Kong L. Influence of different processing methods on mutagenicity of gamboge tree (*Garcinia cambogia*). *Chinese Traditional and Herbal Drugs*, 1997, 28(1), 35-36
- Krishnamoorthy B, Mathew PA, Rema J, Minoo Diwakaran, Jayarajan. Soft Wood Grafting of *Garcinia xanthochymus* (Hook. f.) [Syn. *Garcinia tinctoria* (Wight)]. *Indian Journal of Spices and Aromatic Crops*, 2006, 15(1), 63–64
- Lewis YS. Isolation and properties of hydroxycitric acid. In: Lowenstein J M. (Ed), *Methods in Enzymology*. In: Citric acid Cycle, 1969, 13, Academic Press, New York, pp 613-619
- Mahendran P, Devi CSS. The modulating effect of *Garcinia cambogia* extract on ethanol induced peroxidation. *Indian Journal of Pharmacology*, 2001, 33(2), 87-91
- Naveen GPAN, Krishnakumar G. Atomic Absorption Spectroscopic Analysis of Fruit rind and seeds of *Garcinia* Species. *Indian Journal of Science.* 2012, 1(1), 61-63
- Naveen GPAN, Krishnakumar G. Biochemical analysis and seed oil Characterizations of *Garcinia indica*, *G. xanthochymus* and *G. gummi-gutta* for nutritional qualities. *Indian Journal of Science.* 2012, 1(1), 71-73
- Verghese S, Thomas J. *Garcinia tinctoria* - a lesser-known, evergreen tree of multiple uses. *Indian Horticulture* 2000, 45(2), 21